

CLAIMS

1. Thermoplastic multilayer composite (4) in the form of a hollow body comprising at least one inner layer (1) on the basis of polyamides, at least one intermediate layer (2) as well as at least one thermoplastic outer layer (3)

wherein

the inner layer (1) is formed from a mixture on the basis of different polyamide-homopolymers, and wherein the inner layer (1) additionally comprises a compatibilizer.

2. Thermoplastic multilayer composite (4) according to any of the preceding claims, wherein the inner layer (1) is made of a mixture of at least two components, wherein the first component is a polyamide-homopolymer selected from the group polyamide 6 and polyamide 66, and wherein the second component is a polyamide-homopolymer selected from the group of polyamide 12, polyamide 11, polyamide 1010, polyamide 1212 and polyamide 1012.

3. Thermoplastic multilayer composite (4) according to claim 2, wherein the first component is polyamide 6 and preferably the second component is polyamide 12.

4. Thermoplastic multilayer composite (4) according to one of the claims 2 or 3, wherein the inner layer (1), or the material for the inner layer (1), respectively, is produced at a compounding temperature of at most 280°C and at an extrusion temperature of at most 280°C.

5. Thermoplastic multilayer composite (4) according to claim 4, wherein the compounding temperature and/or the extrusion temperature, respectively, are at most 250°C, preferably in a range between 230°C to 240°C.

6. Thermoplastic multilayer composite (4) according to one of the claims 2 to 5, wherein the weight ratio of the first component to the second component is in a range between 2: 3 to 3: 2, preferably in a range between 2: 3 to 1: 1.

7. Thermoplastic multilayer composite (4) according to any of the preceding claims, wherein the inner layer (1) comprises a compatibilizer in a proportion in the range of 0-30 parts in

in weight, preferably in a proportion of 0-20 parts in weight, and particularly preferably in a proportion of 5-15 parts in weight, with reference to the total of parts in weight of polyamides and compatibilizer.

- 5 8. Thermoplastic multilayer composite (4) according to any of the preceding claims, wherein the inner layer (1) comprises a compatibilizer in a proportion in the range of 5-35 parts in weight, preferably in a proportion of 8-30 parts in weight, and particularly preferably in a proportion of 12-25 parts in weight, with reference to the total of parts in weight of polyamides and compatibilizer.

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9. Thermoplastic multilayer composite (4) according to claim 7 or 8, wherein the compatibilizer is an impact strength modifier, an elastomer or a rubber, preferably an acid-modified ethylene/ α -olefin-copolymer.

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10. Thermoplastic multilayer composite (4) according to any of the preceding claims, wherein the intermediate layer (2) is made of a material on the basis of polyamide 6, a copolyamide like copolyamide 6/12, on the basis of a polyolefin, on the basis of an ethylene/vinyl alcohol-copolymer, or on the basis of a blend of at least two of these components.

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11. Thermoplastic multilayer composite (4) according to any of the preceding claims, wherein the inner layer (1) is located immediately adjacent to the intermediate layer (2), and wherein preferably additionally the intermediate layer (2) is located immediately adjacent to the outer layer (3).

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12. Thermoplastic multilayer composite (4) according to one of the claims 1 to 10, wherein there is provided at least one additional intermediate layer between the intermediate layer (2) preferably made of ethylene/vinyl alcohol copolymer and the inner layer (1) and/or the outer layer (3), wherein this at least one additional intermediate layer is preferably made of a material
30 on the basis of polyamide 6, a copolyamide like copolyamide 6/12, on the basis of a polyolefin or on the basis of a blend of at least two of these components.

13. Thermoplastic multilayer composite (4) according to one of the preceding claims,

wherein the mixture of the inner layer (1) comprises anti-static additives, plasticizers, pigments, stabilizers, flame retardant additives or reinforcement.

14. Thermoplastic multilayer composite (4) according to one of the preceding claims, wherein the multilayer composite is provided as a tube, and wherein the inner layer or a supplementary innermost layer on the basis of a polyamide blend comprises electrically conductive additives.

15. Thermoplastic multilayer composite (4) according to one of the preceding claims, wherein there is provided at least one intermediate layer (2) on the basis of ethylene/vinyl alcohol-copolymer (EVOH), wherein preferentially in this layer there are provided additives for improving mechanical properties like impact strength, stress crack resistance, elongation at break.

16. Thermoplastic multilayer composite (4) wherein the outer layer (3) is made of polyolefin or a thermoplastic elastomer.

17. Thermoplastic multilayer composite (4) according to any of the claims 1 to 15, wherein the outer layer (3) is made of a mixture on the basis of different polyamide-homopolymers, wherein the polyamide is preferably chosen to be a mixture on the basis of at least two components of different polyamide-homopolymers, wherein the first component of the outer layer (3) is a polyamide-homopolymer selected from the group polyamide 6 and polyamide 66, and the second component of the outer layer is a polyamide-homopolymer selected from the group polyamide 12, polyamide 11, polyamide 1010, polyamide 1212 and polyamide 1012.

18. Thermoplastic multilayer composite (4) according to claim 17, wherein the first component of the outer layer (3) is polyamide 6 and wherein preferably the second component of the outer layer (3) is polyamide 12.

19. Thermoplastic multilayer composite (4) according to claim 15, wherein the weight ratio of the first component of the outer layer (3) to the second component of the outer layer (3) is in the range between 2: 3 to 3: 2, preferably in the range between 2: 3 to 1: 1.

20. Thermoplastic multilayer composite (4) according to one of the claims 17-19, wherein the

outer layer (3) additionally comprises a compatibilizer, preferably in a proportion in the range between 0-30 parts in weight, preferably in a proportion between 0-20 parts in weight, and particularly preferably in a proportion between 5-15 parts in weight, with reference to the total of the parts in weight of polyamides and compatibilizer.

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21. Thermoplastic multilayer composite (4) according to any of the claims 17 to 19, wherein the outer layer (3) comprises a compatibilizer in a proportion in the range of 5-35 parts in weight, preferably in a proportion of 8-30 parts in weight, and particularly preferably in a proportion of 12-25 parts in weight, with reference to the total of parts in weight of polyamides and compatibilizer.

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22. Thermoplastic multilayer composite (4) according to claim 20 or 21, wherein the compatibilizer of the outer layer (3) is an impact strength modifier, an elastomer or a rubber, preferably an acid-modified ethylene/ α -olefin copolymer.

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23. Method for producing a hollow body of a thermoplastic multilayer composite according to one of the claims 1-22, wherein the inner layer (1), the intermediate layer (2) as well as the outer layer (3) and possibly additional intermediate layers are joined in a coextrusion process, preferably to form a hose, a pipe or a container, respectively.

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24. Use of a thermoplastic multilayer composite (4) according to one of the claims 1-22 as a tubing for liquid fuel like petrol or diesel as for example for combustion engines.

25. Use of a thermoplastic multilayer composite (4) according to one of the claims 1-22 as a filler neck for fuel tanks, as a fuel system vent pipe, or as a vent pipe for crankcases.

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